ADDENDUM # 1 (12/19/16 correction)

to the

DEFENSE THREAT REDUCTION AGENCY

BROAD AGENCY ANNOUNCEMENT

HDTRA1-17-S-0002

SCIENCE AND TECHNOLOGY

NEW INITIATIVES

EMERGING AND DISRUPTIVE TECHNOLOGY DISCOVERY

1 FUNDING DESCRIPTION

1.1 This addendum serves to supplement the Defense Threat Reduction Agency's (DTRA) Science and Technology New Initiatives Broad Agency Announcement (BAA), HDTRA1-17-S-0002. This research opportunity expands on the Research & Development Technology Area (TA) 6: Technology Forecasting. As detailed in the BAA, TA6 Technology Forecasting states:

"Develop methodologies and tools to discover and analyze emerging or disruptive technologies before they affect the CWMD mission space. Successful methodologies and tools will support technology watching, horizon scanning, and technology-driven threat forecasting and analysis in order to prevent technological surprise. DTRA is interested in approaches that are capable of identifying and analyzing disruptive and emerging technologies, including novel uses for existing technologies and other emerging technologies that may not currently have overt relevance to WMD capabilities or the CWMD mission space, but may in the future."

1.2 DTRA's Research and Development Directorate (J9) is seeking to establish a repeatable, scalable methodology for the discovery of emerging or disruptive technologies that may have an innovative impact on an adversary's WMD capabilities and/or the CWMD mission space in the five- to ten-year timeframe. This is in support of DTRA's efforts to ensure avoidance of technological surprise that may reduce or negate the effectiveness of our countering weapons of mass destruction (CWMD) capabilities.

2 BACKGROUND

2.1 A survey of existing efforts has shown that most current technology discovery and forecasting efforts insufficiently address this challenge. For example, they often employ non-repeating ad-hoc processes, rely exclusively on subject matter expertise, and/or focus on a very narrow range of technologies to identify potential technologies of interest. These efforts are often highly dependent on participants' span of knowledge, and generally limit the breadth of the discovery effort.

2.2 For this topic addendum, the following terms are defined:

2.2.1 Methodology: a specific method, practice, or toolset used for discovery (e.g., Delphi).

2.2.2 Methodological type: a classification of methodologies based on similar features and scope (e.g., data-driven, broad).

2.2.3 Discovery approach: an integrated methodological structure that combines methodologies and methodological types for the purposes of discovery.

2.2.4 Discovery process: the systemic progression of a discovery approach from initiation to output—a discovery approach put into action.

3 OBJECTIVE

3.1 This effort is focused on discovery. Based on the premise that no single methodology is sufficiently able to meet the challenge, DTRA J9 is interested in approaches that systemically integrate various methodologies to support discovery and identification of emerging technologies and/or disruptive applications of technologies. Such integrated discovery approaches should: (1) support a process for searching, culling, collecting, and curating the various input streams from each methodology; (2) translate the data into usable information; and (3) capture the outputs for later analysis and synthesis.

3.2 The goal is to identify emerging and disruptive technologies before they have an impact on

an adversary's WMD capabilities and/or the CWMD mission space out to an approximate ten-year time horizon.

3.3 The discovery processes under this BAA will serve as the first step in an integrated construct that will compile and distribute discovery outputs through a program integration mechanism and ultimately provide technology issues for further analysis. The resulting analyses will feed technology forecast outputs and enhance situational awareness within DTRA and the wider CWMD Community of Interest.

3.4 Offerors should propose a discovery approach to meet initial phase and optional second phase objectives, as follows:

3.4.1 Phase 1. During the initial phase (total of 12 months), Offerors should (1) present a detailed description of the proposed discovery approach (that is, an integrated methodological structure that combines methodologies and methodological types) and a demonstration plan of their discovery process (that is, the systemic progression of their discovery approach from initiation to output) within 4 months, and (2) from that plan, demonstrate the feasibility of their discovery approach by the end of the phase. Offerors are afforded latitude in designing a discovery approach and discovery process to meet the sponsor's overall objective. However, a detailed discovery process description and demonstration plan should fully document the technical approach and execution plan, including all tools, procedures, techniques, processes, sequences, actions, as well as any data sets, ontologies, measures, and any other inputs to or outputs from the discovery process. The description should also articulate any limitations, assumptions, hypotheses, parameters, or design decisions inherent to the approach. A successful demonstration should prove the feasibility of the Offeror's discovery process and discover approach through an event such as an experiment, exercise, pilot study, test, trial, or other form of research. A Phase 1 demonstration should focus primarily on proving successful interoperability and valid systemic progression among the methodological components of the Offeror's approach (as articulated in the discovery process), rather than on actionable discovery outputs. Offerors must document Phase 1 in a detailed end-of-phase report and presentation, and should plan to provide periodic progress reports such that the sponsor can make a considered decision about proceeding to Phase 2.

3.4.2 Phase 2. DTRA is interested in how to most effectively demonstrate the functional use of an Offeror's approach to discover emerging and/or disruptive technologies of interest. Based on sponsor review of Phase 1, DTRA may approve a second 12-month phase of discovery approach development focused on utility. Offerors should therefore include in their proposals a costed option for the second phase that will demonstrate the functional use of their discovery approach to uncover emerging and/or disruptive technologies of interest. Offerors should make assumptions where needed in pricing this option to demonstrate the functionality and utility of their discovery process in generating actionable outputs and findings that support identification of emerging technologies and/or disruptive applications of technologies. As in Phase 1, Offerors should fully document their technical approach and execution plan, and articulate any limitations, assumptions, hypotheses, parameters, or design decisions inherent to their approach. Offerors must document Phase 2 in a detailed end-of-phase report and presentation.

3.5 DTRA is not seeking to fund development of wholly new methodologies from the ground up. Rather, this initiative seeks to take advantage of existing methodologies for the benefit of CWMD discovery efforts, or assist nearly completed developmental methods in reaching a point

where they can be applied to the purpose of discovery tailored for the CWMD mission. Proposed discovery approaches should therefore use methodologies that can be adapted to a CWMD-related purpose, and should be compatible with operations in both unclassified and classified domains.

4 TECHNICAL AREAS OF INTEREST

4.1 DTRA J9 is interested in approaches that systemically integrate various methodologies to support discovery and identification of emerging technologies and/or disruptive applications of technologies. While Offerors are not prohibited from proposing individual methodologies only, DTRA has a significantly greater interest in integrated discovery approaches that effectively combine methodologies from a mix of methodological types, such as:

4.1.1 Expert-Driven, Focused methodologies, such as those that organize subject matter experts to examine a known technology rapidly or technological trend in detail. These methodologies should be able to concentrate efforts on a particular technology or category of technologies aimed at yielding an assessment of the technology's potential impact to the CWMD mission space. Examples of expert-driven, focused methodologies include dialogues, directed studies, and games. (Note: While DTRA considers this methodological type valid, it is fairly well understood and should not be the predominant focus of a proposed discovery approach.)

4.1.2 Expert-Driven, Broad methodologies, such as those that are capable of harnessing small and/or large groups of expertise to uncover numerous emerging technologies and novel uses for existing technologies that may impact the CWMD mission space. Such methodologies should be as wide-lensed as possible, so that even emerging technologies without obvious impact to the CWMD mission space may still be captured for potential assessment and/or analysis of how the technology might evolve. Examples of expert-driven, broad methodologies include crowd sourcing, Delphi methods/repeated period elicitation, and folksonomies.

4.1.3 Data-Driven, Focused methodologies, such as those that use data collection, data correlation, data curation, and trend identification/analysis tools, or other approaches that are capable of identifying, ingesting, processing, sorting, and indexing large datasets to examine a known WMD technology or technological trend in detail. Such methodologies should concentrate on previously identified technologies or technology areas, and should aim at identifying any potential applications of the technology within the CWMD mission space. Examples of data-driven, focused methodologies include bibliometrics, text semantics, natural language processing, and scientometrics.

4.1.4 Data-Driven, Broad methodologies, such as those that employ data collection, data correlation, data curation, and trend identification/analysis tools, or other approaches that are capable of identifying, ingesting, processing, sorting, and indexing large datasets to identify emerging technologies and/or novel uses for existing technologies. Such methodologies should be as wide-lensed as possible, so that emerging technologies without any obvious impact to the CWMD mission space may still be captured for potential assessment and/or analysis of how the technology might evolve. Examples of data-driven, broad methodologies include web scrapers, structured or unstructured search engines, and predictive analytics.

5 MAJOR MILESTONES

5.1 The schedule for Addendum #1—Science for Emerging and Disruptive Technology Discovery is captured in the following table:

DATE	EVENT
December 1, 2016	BAA Addendum announced in FedBizOpps website
December 1, 2016	Begin registration at the DTRA proposal submission website
December 22, 2016	Deadline to submit questions
January 11, 2017	Questions and Answers posted at FedBizOpps
January 24, 2017	Final day to submit optional quad chart/white paper for comment
February 8, 2017	DTRA J9 email responses to Offerors who submitted quad charts/white papers by the deadline of January 24, 2017
March 9, 2017 No later than 2:00 p.m. EDT	Formal proposal receipt deadline
On or about April 28, 2017	Notifications will be sent to Offerors via email
On or about September 18, 2017	Estimated first award date
Awards expected to begin approx. 150 days following initiation of negotiations [1, 2]	
Notes: 1. Actual award dates will vary based on receipt of funding, complexity, statutory requirements, proposal quality, pricing considerations, DCAA audits of proposed rates, type of instrument, number of awards, and other considerations. All dates are subject to change. 2. Awards will be made subject to the availability of funds. All Offerors will be invited to begin negotiations upon notification of intent to award.	

6 FORMAL PROPOSAL SUBMISSION INSTRUCTIONS

6.1 The suggested duration of potential efforts is approximately 24 months total for both Phase I and the Phase II option, e.g. 12 months for Phase I and 12 months for Phase II. The anticipated dollar value is on the order of $1.0M (Phase I), and $1.5M - $2.0M (Phase II) for a total of $2.5M-$3M for an end-to-end effort. Formal proposals should include the cost of Phase I and a costed option for Phase II in accordance with objectives described in paragraphs 3.4.1 and 3.4.2.

6.2 Emerging and disruptive technology discovery formal proposals should be prepared and submitted in accordance with the guidance provided in HDTRA1-17-S-0002, the Science and Technology New Initiatives BAA.